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## ISSODUN: THE MAKING OF AMERICA'S FIRST EAGLES

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by

Major Douglas A. Galipeau

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*Abstract*

When America declared war on Germany in April, 1917, the Army Air Service was virtually non-existent. At the time, there was no military training program capable of producing the number of aviators required at the front and no plans existed to create one. In the relatively short time span of just less than two years, the American training program was born and became arguably the finest program in the world. This transformation from nonexistence came about by adopting and combining the training methods of our European allies who's programs were well established upon U.S. entry into the war. Issodun, the "finishing" school for America's pursuit pilots, was the largest aviation training center of its time and the crown jewel of the American military aviation training program.

## **Chapter 1**

### **Issodun: The Making of America's First Eagles**

*As to our aviators, many of whom trained with our allies, it can be said that they had no superiors in daring and in fighting ability. During the battles at St. Mihiel and Meuse-Argonne our aviators excelled all others. They have left a record of courageous deeds that will ever remain a brilliant page in the annals of our Army.*

— General John J. Pershing

### **Introduction**

When America declared war on Germany in April, 1917, the Army Air Service was virtually non-existent. America's air forces, then called the Aviation Section of the Signal Corps consisted of about 65 officers rated as flyers and approximately 1,100 enlisted men.<sup>1</sup> It possessed only about 200 training aircraft: none were front-line quality and the U.S. aviation industry was not producing aircraft for service at the front.<sup>2</sup> At the time, there was no military training program capable of producing the number of aviators required at the front and no plans existed to create one.

Yet when hostilities ceased on November 11, 1918, there were 7,726 officers and 70,769 enlisted men assigned to the Air Service.<sup>3</sup> Of those numbers 767 pilots, 481 observers, and 23 aerial gunners were in 45 American squadrons serving with armies at the front.<sup>4</sup> American industry had begun to fulfill its promise, delivering 1213 DH-4s and

over 2,000 Liberty engines between April of 1917 and November of 1918.<sup>5</sup> A total of 26 overseas schools—16 under American control—were training pilots and observers and had graduated 1,674 fully trained pilots and 851 observers.<sup>6</sup> The performance of these fledgling eagles was in the words of General Pershing without equal.<sup>7</sup>

The story of America's first eagles is inextricably intertwined with the development of the U.S. training program. In the relatively short time span of just less than two years, the American training program was born and became arguably the finest program in the world. This transformation from nonexistence came about by adopting and combining the training methods used in the well established programs of our European allies. Issodun, the “finishing” school for America’s pursuit pilots, was the largest aviation training center of its time and the crown jewel of the American military aviation training program.

### Notes

<sup>1</sup> Shipley Thomas, *The History of the A.E.F.* (New York: George H. Doran Company, 1920), 385.

<sup>2</sup> Ibid.

<sup>3</sup> James G. Harbord, *The American Army in France—1917-1919* (Boston: Little, Brown, and Company, 1936), 504.

<sup>4</sup> Maurer Maurer, ed., *The U.S. Air Service in World War I* (Washington D.C.: The Office of Air Force History, Headquarters USAF, 1978), 17.

<sup>5</sup> Thomas, 387.

<sup>6</sup> Ibid., 51.

<sup>7</sup> General John J. Pershing, *Final Report of Gen. John J. Pershing—Commander-in-Chief American Expeditionary Forces* (Washington D.C.: Government Printing Office, 1920), 76.

## **Chapter 2**

### **America's Entry into World War I**

By the middle of 1917 it was apparent that America would become enmeshed in the war in Europe. Many on both sides of the Atlantic thought that it would be unnecessary, if not impossible, to organize, equip, and transport a large enough ground force to have a significant impact on the numerical balance between the Allied forces and their enemy. Both the French and British felt that America should limit its ground participation to a moderate level. The Allies thought the United States could most effectively aid their cause by providing a powerful air force to the Western Front in time to participate in the 1918 campaign.<sup>1</sup>

In May of 1917, French Premier Alexandre F. Ribot sent the following cablegram to President Woodrow Wilson:

It is desired that in order to cooperate with the French aeronautics, the American Government should adopt the following program: the formation of a flying corps of 4,500 airplanes - personnel and material included - to be sent to the French front during the campaign in 1918. The total number of pilots, including reserve, should be 5,000 and 53,000 mechanicians. 2,000 planes should be constructed each month as well as 4,000 engines by the American factories. That is to say, that during the first six months of 1918, 16,500 planes (of the last type) and 30,000 engines will have to be built. The French Government is anxious to know if the American Government accepts this proposition, which would allow the Allies to win supremacy of the air.. (signed) "Ribot"<sup>2</sup>

Known simply as the “Ribot Cable,” this proposal was approved by the War Department on 27 May and was to become the basis for the army aviation expansion effort.

The enormity of this undertaking seems to have been lost on U.S. policymakers. The Ribot cable in effect, was asking America to produce more in one year than France had done in three years of war.<sup>3</sup> Moreover, this expectation was prefaced on an industrial infrastructure that lagged far behind those of the European powers. Young Henry H. Arnold, then a major, certainly realized just how enormous the task facing the U.S. was when he wrote:

We were told to prepare a bill for Congress. Our understaffed Airplane Division in the War Department received the news with great interest. It was our first program....At this time we ranked fourteenth among the nations of the world in aviation. Actually it was worst than that. Statistics aside, we had no airpower at all. In the raw, the country's manpower, industrial strength, and the national know-how in general assured the building of any kind of military force we wanted—if there was a realistic organization of energy and material, and if there was time. Was there time?<sup>4</sup>

Although the concerns of Major Arnold and many others were focused primarily on industrial mobilization and the production of aircraft, it was also apparent that training and production of aviators would present a tremendous challenge.

Any doubts about America’s ability to meet these challenges were rapidly overshadowed by both public and political enthusiasm. In order to gain support for the unprecedented appropriations that such a program required, many in Congress and the military made some seemingly rash predictions about the ability to meet the goals set forth in the Ribot cable. Even though Congress appropriated over \$600 million for the effort, it was soon obvious that America would not be able to live up to the original agreement. Within months a revised air program was presented to the allies.

The failure to meet the original air program was due primarily to the lack of experience on the part of American industry. This lack of experience was further exacerbated by the reluctance of the Allies to share their knowledge of aviation technology. "Probably no military secrets were more closely guarded in Europe than developments in aircraft."<sup>5</sup> While the same lack of experience also caused the original estimates for the training program to be readjusted, the French, British and to some extent Italians were much more willing to share their expertise in training with the Army Air Service. The Air Service was able to take advantage of these well established programs to create a program that encompassed the best training methods of the day.

#### Notes

<sup>1</sup> James J. Hudson, *Hostile Skies—A combat History of the American Air Service in World War I* (New York: Syracuse University Press, 1968), 4.

<sup>2</sup> Lt. Lucien H. Thayer, *America's First Eagles* (San Jose, CA: R. James Bender Publishing, 1983), 11.

<sup>3</sup> Hudson, 5.

<sup>4</sup> Ibid.

<sup>5</sup> Arthur Sweetser, *The American Air Service—A Record of Its Problems, Its Difficulties, Its Failures, and Its Final Achievements* (New York: D. Appleton and Company, 1919), xxvii.

## **Chapter 3**

### **The French Experience**

When World War I broke out in 1914, aviation in Europe was still in the early stages of infancy. France, the leading air power of the day, had an air force made up of only 260 aircraft and 171 pilots.<sup>1</sup> Although similar in size to the U.S. air force of 1917, many in France were well aware of the value of aviation to the military prior to the start of World War I. This recognition was reflected in France's aeronautical appropriations, which in 1913 exceeded \$700 million.<sup>2</sup> The knowledge and experience gained from these developmental efforts and the early years of the world's first "air war" resulted in an aviation training program which was second to none and produced many of the finest aviators of the time.

The French training program in World War I, sometimes referred to as the "Bleriot" system, was based on the concept of self-reliance. After about two months of ground training in the theory of flight the student progressed to the flying stage. From the first day of flying until the student received his wings he was alone in the cockpit. The curriculum relied on the individual to "teach" himself to fly through a carefully planned step-by-step process.

The first stage, known as the Penguin, was not really flying at all. After a brief lesson on the use of the rudder bar, the student was placed in an under-powered Bleriot, whose

clipped wings allowed the student to raise the tail but made it virtually impossible to leave the ground. The student would then run the Penguin up and down the field at about 40 m.p.h. attempting to maintain a relatively straight path. After a series of successful runs, usually around six, the student graduated to the *roleur*.

The focus of *roleur* class also focused on maintaining what the French termed “line de vole” or line of flight. In this class though, the Bleriot’s wings were not clipped and the airplane was capable of limited flight. This stage was supposed to teach the student how to keep the airplane on the ground when it wanted to fly. Again, after a series of successful runs the student was graduated to the next phase of training.

In the *decolle* class the student pilot was allowed to “fly” the airplane down the field in series of short hops, a couple of meters in height. In this stage the student was not taught to land the plane, per se, but to simply pull back the power and let the plane settle back to the ground. The first attempts at landings came in the *pique* class which followed immediately after the *decolle*.

The *pique* class was the student’s first chance to “...point the machine toward the ground...” and was made up of two stages.<sup>3</sup> In the first stage the student executed the *decolle* to height of approximately 20 feet and then pointed the aircraft down to land. Next came the advanced *pique* which consisted of a climb to 300 feet, flying a box around the field using flat, rudder-only turns and finished with a power-off landing.<sup>4</sup> This power landings were required during this stage because, as the student was told, “...engines...did not always function as one wished.”<sup>5</sup> At the discretion of the instructor the student was passed to next phase and began learning basic combat maneuvers.

Maneuvers taught to the students at this stage of training progressed gradually from simple maneuvers such as banked turns to figure-eights and spirals. As the student became more proficient at these maneuvers he moved on to better and faster airplanes, climbing to greater altitudes, making short trips and perfecting his basic skills. To leave this stage the student pilot had to climb to an altitude of two thousand feet, turn his motor off, spiral down to the ground, and land within a few yards of a fixed point on the ground.<sup>6</sup> With this successfully completed the student moved on to the last phase of training prior to receiving his *brevet* or pilot wings.

In the *voyages* phase the student pilot was required to pass both a cross-country test and an altitude test. The first consisted of a flight in which the student demonstrated that he could successfully navigate between three points located 60 miles apart. In the second test the student pilot was required to spend at least one hour above 2000 meters (about 7,000 feet). This was to ensure a familiarity with the conditions at high altitudes. With these two tests completed the student officially became a *pilote-aviateur* and was allowed to wear the coveted gold wings.<sup>7</sup>

The final step for the French pursuit pilot before going to the front was the *ecoles de perfectionnement*—the fighter school at Pau. At Pau the same philosophy prevailed as in the basic training program. Self-reliance was key and as in the basic schools the pilots were alone in the cockpit from the first day of training. This is where the pilot perfected the skills necessary to survive at the front. In addition to advanced combat maneuvers such as the spin, *renversements*, vertical banks, and wing slip the future pursuit pilot also learned gunnery skills and how to fly and fight in formations. As the pilot's skills in these maneuvers improved he moved on to progressively more capable and powerful aircraft in

preparation for those he would encounter at the front.

The average time for a French pilot to complete his training and to report to the front was about six months.<sup>8</sup> During that six months, he received an average of 60-80 hours of flying time, almost all of it alone.<sup>9</sup> While the French method of training was relatively lengthy when compared to the British, it did produce some of the most successful and self-reliant pilots of the war. In the words of Edward Parsons, an American with the Lafayette Escadrille, “When we were ready for the front a couple of months later, we were pretty well heeled as fliers. And except verbally, no one had ever shown us the way. We taught ourselves, and it made a splendid solid foundation, with loads of self-confidence to back it up.”<sup>10</sup>

### Notes

<sup>1</sup> I.B. Holley, Jr., *Ideas and Weapons* (Washington D.C.: U.S. Government Printing Office, 1983), 29.

<sup>2</sup> Ibid.

<sup>3</sup> Stuart Walcott, *Above the French Lines* (Princeton: Princeton University Press, 1918), 21.

<sup>4</sup> Commander Reginald Sinclaire, transcript of oral history interview by Lt Col Thomas Julian, 21 Nov 1969, 14, AFSHRC, Maxwell AFB, AL.

<sup>5</sup> Herbert Molloy Mason, Jr., *High Flew the Falcons—The French Aces of World War I* (Philadelphia: J.B. Lippincott Company, 1965), 56.

<sup>6</sup> James R. McConnell, *Flying For France* (New York: Doubleday, Page & Company, 1917), 150-151.

<sup>7</sup> Ibid., 152.

<sup>8</sup> Lee Kennett, *The First Air War* (New York: The Free Press, 1991), 125.

<sup>9</sup> Ibid., 124, and Sinclaire, 21-22.

<sup>10</sup> Edwin C. Parsons, *I Flew With the Lafayette Escadrille* (Indianapolis: E.C. Seale & Company, Inc., 1937), 67.

## **Chapter 4**

### **The British Experience**

Within days of Germany's invasion of Belgium England deployed the fledgling Royal Flying Corps to the European continent. At the time, the RFC consisted of less than 200 pilots and 100 aircraft.<sup>1</sup> While many in Great Britain recognized the inherent military value of the airplane, the resources invested in the development of aircraft and aviators were relatively small.<sup>2</sup> Even as late as the summer 1915 there were only 200 pilots in training; the government simply assumed that civilian flyers could be called on to increase the number of aviators if required.<sup>3</sup> As the war progressed it became apparent that aviators and their machines would play a much greater role in the war. By the time the Armistice was signed in 1918, England had developed one of the most prolific training programs in Europe—producing 26,000 pilots in a span of less than 4 years.<sup>4</sup>

The British method of instruction differed greatly from the “Bleriot system” used by the French. The French used a highly structured, step-by-step process which allowed the student to “teach” himself to fly through trial and error. The British relied on a dual-control method of instruction in which every phase of flight was demonstrated by the instructor then repeated by the student. Prior to 1917 though, there were no precise guidelines prescribed for how this training was to proceed. By the later part of 1916, many in the RFC began to question the readiness of new pilots arriving in France. Major

Robert Smith-Barry, a commander of a front-line squadron in France, considered the instructors and their methods of instruction the key to the problem, and in December of 1916, wrote a paper proposing a restructuring of British training methods.<sup>5</sup> In 1917, the RFC adopted Smith-Barry's program and his 42-page training manual which provided a detailed plan for the training of student pilots as well as their instructors.<sup>6</sup>

The potential aviator's first experiences with the RFC were less than promising. All officers were temporarily stripped of rank and became cadets for a six month probationary period or until they completed the training program.<sup>7</sup> The cadet then spent as long as six weeks in "depot" waiting for a vacancy in the training program.<sup>8</sup> While some rudimentary aviation training was received at the depot, most of the cadet's time was filled with marching and inspections.

From the depot, the cadet moved on to one of the two Schools of Military Aeronautics. The course of instruction covered topics such as: rigging, internal-combustion engines, map reading, compasses, Morse Code and aeronautics.<sup>9</sup> After the written exams at the end of the month long course, the cadet moved on to the flying training squadron.

Early flight training was accomplished using a wide assortment of aircraft, such as the Bleriot, Bristol Boxkite and the Farnham "Longhorn" and "Shorthorn," but with the adoption of the Smith-Barry training program the Avro 540K became the primary trainer of the RFC.<sup>10</sup> The Avro was a two seat airplane that possessed many of the characteristics of the aircraft being flown at the front line yet was simple enough for student pilots to master. The student was in the front seat from the beginning of training and initially, remained in contact with the instructor through movements of the flight controls. Later in

the war, the British adapted a “speaking tube” used by restaurant waiters in London for inflight communication with students.<sup>11</sup>

Smith-Barry’s idea to use a single type airplane with a standard configuration was closely paralleled by the course of instruction developed in his manual. Teaching methods and abilities prior to Smith-Barry, varied as greatly as the fleet of trainers used prior to the Avro 540K.<sup>12</sup> His manual provided a standard progression that ensured all students received the same basic instruction. Under this system, each instructor was assigned five or six students with whom he stayed throughout the entire course of instruction.<sup>13</sup> A discussion of theory and maneuvers preceded each flight. Instructors taught the following events (in order) as prescribed by Smith-Barry’s manual, “...demonstration of controls, straight and level flying, turns, misuse of controls in a turn, action of controls with motor cut off, slow flying and glide turns, and, finally, take-off and landing.”<sup>14</sup> From the first flight, the student was on the controls with the instructor to allow him to get a “feel” for the each maneuver before attempting it himself.

When the student pilot mastered all of these basic maneuvers, he went through a series of solo flights. This was really the culmination of the Smith-Barry program, the purpose of which, according to Smith Barry was “...not...to prevent fliers from getting into difficulties or dangers but to show them how to get out of them satisfactorily and having done so, to go and make them repeat the process alone.”<sup>15</sup> Prior to each solo flight the instructor specified the series of maneuvers to be performed and following the flight each maneuver was analyzed by the instructor and student. This period of solo flying was followed by more dual-control flight to perfect the maneuvers the student had practiced solo.

Following the award of his certification as a member of the RFC (and more importantly his wings), the British pursuit pilot followed much the same path as his French counter-part. The special gunnery schools like the one at Hythe was the new pilots first exposure to mounted machine guns.<sup>16</sup> After receiving instruction in aerial gunnery the pursuit pilot spent about two weeks at one of the schools specializing combat maneuvers (Turnberry, Marske, Sedgeford, Freiston, East Fortune, and Ayr) before going to the front.<sup>17</sup> These schools exposed the new pilot to combat maneuvering and perhaps more importantly, this was the first chance for the new pilot to fly the type aircraft being actively flown at the front. In 1918, the British pursuit pilot arrived France with a combined total of about 50 hours of solo flying (compared to 60-80 for his French counterpart).<sup>18</sup> In most cases, the new pilot spent as long as three weeks at the replacement base in St. Omer before joining a front line unit.

### Notes

<sup>1</sup> Duncan Grinnell-Milne, *Wind in the Wires* (Garden City, NY: Doubleday & Company, Inc., 1968), 3. Winter, 19.

<sup>2</sup> Walter Raleigh, *The War in the Air—Being the Story of the Part Played in the Great War by the Royal Air Force Vol. I*(Oxford: The Clarendon Press, 1922), 199-201. Holley, 29.

<sup>3</sup> Denis Winter, *The First of the Few—Fighter Pilots of the First World War* (Athens, GA: The University of Georgia Press, 1982), 18.

<sup>4</sup> Ibid., 19.

<sup>5</sup>John H. Morrow, *The Great War in the Air* (Washington, D.C.: Smithsonian Institution Press, 1993), 175. and Peter H. Liddle, *The Airman's War 1914-18* (New York: Blandford Press, 1987), 75.

<sup>6</sup> Ibid., 30.

<sup>7</sup> Richard Townshend Bickers, *The First Great Air War* (London: Hodder & Stoughton, 1988), 16.

<sup>8</sup> Winter., 27.

<sup>9</sup> Norman Macmillan, *Into the Blue* (New York: Avro Press, 1929), 16.

<sup>10</sup> Bickers, 17. Ibid., 21. Winter, 30.

<sup>11</sup> Winter, 33.

<sup>12</sup> Macmillan, 26.

### **Notes**

<sup>13</sup> Millie Glasebrook, ed., *American Aviators in the Great War 1914-1918* (Carson City, NV: Glasebrook Foundation, 1984), 134.

<sup>14</sup> Winter, 33.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid., 45.

<sup>17</sup> Ibid., 46.

<sup>18</sup> Ibid., 57.

## **Chapter 5**

### **The American Experience**

When the U.S. entered World War I in 1917 there existed no formal aviation training program. The only aviation training facilities to speak of were located at North Island, in San Diego, California and at Mineola, on Long Island, New York.<sup>1</sup> At that time the program was relatively small-scale and unstructured with less than 100 students under instruction.<sup>2</sup> In the words of General Scriven, the instructors at these schools (a mix of military and civilian) "...with little or no experience and with no precedent to guide them, have had to train themselves and their subordinates at the same time."<sup>3</sup> A much larger and more formalized program had to be developed to accommodate the large number of student pilots necessary to fill the Air Service squadrons planned for deployment to Europe.

Having no precedent of its own to guide the development of such a training program, the decision was made early on to adopt the methods currently being used by the Allies. To expedite the development of a stateside program the Canadian program (which was the RFC training program) was copied in near totality. It included ground school (from eight to ten weeks), preliminary flight training (three to four months), advanced flight training (two to three months), and specialized flight training such as aerial gunnery, bombing, or

observation schools (from two to four weeks).<sup>4</sup> Within weeks of the American declaration of war, work began on the implementation of this ambitious program.

The development of the ground schools was the brainchild of then Major Hiram Bingham, a history professor from Yale University. In May of 1917, Bingham and representatives of the universities of California, Texas, Illinois, Ohio, Cornell, and the Massachusetts Institute of Technology were invited to go to Toronto to see how the University of Toronto was cooperating with the Royal Flying Corps in providing ground training to potential aviators.<sup>5</sup> This committee decided, in the words of Bingham, "...that we could do no better than to copy as nearly as possible the curriculum adopted by the Royal Flying Corps after more than two years of war."<sup>6</sup> As will be seen later, flying training conducted in the U.S. also adopted British training methods. By the end of May, the six universities (later eight, when Princeton and Georgia Tech joined the program) had opened the doors to their newly established ground schools.

Known as the United States Schools of Aeronautics, the purpose of these ground schools was three-fold. The primary purpose was to "...teach the candidates their military duties and to develop in them soldierly qualities and prompt obedience."<sup>7</sup> The second was to provide a basic foundation in the aviation theory and practices of the day prior to beginning flying training. In addition to supplying a steady stream of pupils to the flying schools, the third purpose of the ground schools was to "...eliminate undesirables at the relatively inexpensive ground schools before they should have the opportunity of wasting the valuable time of flying instructors and the very expensive facilities offered on an airdrome."<sup>8</sup>

Much like his British counterparts, the prospective American pilot entered the ground school as a flying cadet. This rank was maintained throughout the course of training until the cadet passed his Reserve Military Aviator (RMA) test and received his commission.<sup>9</sup> During his eight weeks to twelve weeks of training, the cadet was subjected to a rigorous program which included basic instruction on: the principles and theory of flight, radio, codes, and photography; the operation and maintenance of aircraft engines and machine guns, the care of the airframe itself; and in meteorology and astronomy.<sup>10</sup> Considerable time was also devoted to learning discipline, military law and some idea of officer behavior.<sup>11</sup>

Upon completion of the ground school phase, the next step in the program was supposed to be preliminary flight training. By the early summer of 1917, it was obvious that the construction of flight training bases in the U.S. was not keeping pace with the output of cadets from the ground schools. In an effort to obviate this surplus until sufficient training fields could be constructed, many of the early ground school graduates were sent to Canada to receive their preliminary flight instruction.

Additionally, the United States was asked to send 100 cadets a month to France for preliminary training beginning in July of 1917. Because many of these cadets did not reach France until the late fall of 1917 the training positions they were promised were no longer available.<sup>12</sup> Numbering over 1,000, most these cadets were the “honor graduates” of their respective ground school classes and had been sent to Europe as a reward for their performance. Although all of the cadets eventually received flight training, many months were spent in limbo waiting for the chance to climb into a cockpit. Fortunately, this was not the typical path of progression for the cadets who remained in the U.S.

After successfully completing final examinations most cadets were transferred to one of the preliminary flight schools in the U.S. The method of instruction at the preliminary schools closely paralleled that of the RFC. In addition to the early decision to model the stateside program on the RFC's program, many of the early flying instructors in the U.S. were British pilot with combat experience. Each instructor was assigned five or six students for the duration of the program. The training was conducted in stages beginning with a dual-control stage in which the student flew with an instructor until he was ready to fly solo. The first stage was typically completed after about six hours of dual control flying.<sup>13</sup> The second stage consisted of both solo flights and flights with instructors. As with their British counterparts, the American cadets flew with instructors during this stage to have a new maneuver or series of coordinated exercises demonstrated, after which they would practice them alone. After about 50-60 hours of total flying time, the cadet was given his RMA test.<sup>14</sup>

The RMA test was a flight evaluation administered by a "check" pilot and typically consisted of the following events:

1. Climb out of a field 2,000 square feet and attain 500 feet altitude, keeping all parts of the machine inside the square during the climb.
2. Glides at normal angle, with motor throttled. Spirals to right and left. Change of direction in gliding.
3. At 1,000 feet cut off motor and land within 200 feet of a previously designated point.
4. Land over an assumed obstacle 10 feet high and come to rest within 1,500 feet of the same.
5. Cross-country triangular flight of 30 miles, passing over two previously designated points. Minimum altitude 2,500 feet.
6. Straight-away cross-country flight of 30 miles. Landing to be made at a designated destination. Both outward and return flights at a minimum of 2,500 feet.
7. Fly for 45 minutes at an altitude of 4,000 feet.<sup>15</sup>

Upon completion of the RMA, the cadet received his RMA wings and was commissioned a lieutenant.

Following preliminary training, the vast majority of American pilots proceeded overseas for their advanced training and gunnery training. Although advanced flying schools were being established in the U.S., it was apparent that they would not produce qualified pilots quickly enough to meet the demands of the Allies and the American Expeditionary Force (A.E.F.). The advanced training program in the U.S. was slow to develop due lack of qualified, combat-seasoned instructors, advanced aircraft of the type being flown at the front, and the insufficiency of U.S. training doctrine and standards.<sup>16</sup> General Pershing told the War Department in early August of 1917, "Can not have too many pilots too soon. Send them over and we will take care of them."<sup>17</sup> Even though, the French agreed with General Pershing and were willing to assist wherever possible by taking American pilots into their schools, it soon become obvious that the Americans would have to have their own training areas in France.

#### Notes

<sup>1</sup> Percival T. Gates, *An American Pilot in the Skies of France—The Diaries and Letters of Lt. Percival T. Gates*, ed. David K. Vaughn (Dayton, OH: Wright University Press, 1992), 6.

<sup>2</sup> Sweetser, 97.

<sup>3</sup> Ibid., 24.

<sup>4</sup> Ibid., 114-119.

<sup>5</sup> Hiram Bingham, *An Explorer in the Air Service* (New Haven: Yale University Press, 1920), 12.

<sup>6</sup> Ibid., 20-21.

<sup>7</sup> Ibid., 47.

<sup>8</sup> Ibid., 20.

<sup>9</sup> Hudson, 28.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Maurer, 94.

## Notes

<sup>13</sup> Stuart E. Elliott, *Wooden Crates & Gallant Pilots* (Philadelphia: Dorrance & Company, 1974), 32.

<sup>14</sup> Hudson, 29.

<sup>15</sup> Ibid.

<sup>16</sup> James J. Cooke, *The U.S. Air Service in the Great War, 1917-1919* (Westport, CT: Praeger Publishers, 1996), 19.

<sup>17</sup> Ibid.

## **Chapter 6**

### **Issodun**

By the summer of 1917, two and a half years of the air war had begun to take a serious toll on the number of French and British aviators. While America possessed a relatively enormous pool of human resources, she lacked the well developed training methods and aircraft production capabilities of the Allies. In order to maximize the resources of both, the French submitted a memorandum to General George O. Squier, then the Chief Signal Officer of the U.S. Army, suggesting the establishment of an American advanced flying school in France.<sup>1</sup>

The site decided upon for this advanced aviation school was Issodun, France. Issodun, located about 100 miles southeast of Paris, was primarily chosen because the surrounding countryside was extremely level and relatively sparsely populated with wide-open spaces for flying fields.<sup>2</sup> The site was also relatively close to a major government-owned railroad line. Probably just as important was its proximity to the aviation factories and new plane assembly fields in the south which were to supply the aircraft to be used in the training at Issodun. Inspite of the advantages of this location, significant work was required to bring the Third Aviation Instruction Center (3<sup>rd</sup> AIC), as it was to be named, to life.

When General Pershing first saw the site it was nothing but a series of flat fields, with no barracks, hangars, buildings or classroom facilities.<sup>3</sup> Under the agreement with the French, the United States was, "...to furnish 200 workmen to erect it (3<sup>rd</sup> AIC) and 'all the tools, nails and other implements necessary,' including a narrow-gauge railroad, while France was to furnish the planes, motors and suitably cleared land."<sup>4</sup> With this accomplished, American pilots were to begin training in July of 1917 and be ready for the front in the fall of the same year.

While this proposal was approved by Pershing, it met some resistance when it reached the Secretary of War. With an initial price tag of almost \$800,000 just to open the field, the proposal was rejected by the Secretary of War on May 19, 1917.<sup>5</sup> That same day the proposal was resubmitted with the additional argument that a facility such as the 3<sup>rd</sup> AIC was critical to the development of the air forces that would accompany the A.E.F. to Europe. This time the proposal was accepted and by July of 1917 the first Aero Construction Squadrons began to arrive in France.

By early fall of that same year construction at the field was in full-swing. While the initial pace of building was hectic in an effort to make the base operational as quickly as possible, construction at Issodun was never really completed and continued right up to the Armistice. An early arrival at Issodun in the fall of 1917 wrote:

There are acres of ground just littered with great piles of lumber, and supplies of every description. Our own branch railway bringing carloads of everything. Many buildings of all kinds are already up and going; others in the process of speedy construction. Half a mile away you can see row after row of great canvas hangars....Everywhere is hustle, activity, (and loads of mud).<sup>6</sup>

As a result of this furious pace of construction, Issodun was fully operational and training was being conducted within a months of Pershing accepting the base.

The 3<sup>rd</sup> AIC at Issodun was initially to be merely a "refresher course" for American pursuit pilots arriving in France, prior to being sent to the front. The intent was for the American pilots, having already received advance training in the United States, to become acquainted with the current tactics and aircraft being used at the front. As described earlier, the advanced aviation schools in the U.S. were slow to develop and lacked both aircraft of the type being used at the front and pilots with combat experience to act as instructors. This lack of advance training in the U.S. dictated the development of a complete course in advanced flying and aerial tactics at Issodun.

Initially, the school was initially staffed primarily by French instructors, used French airplanes, and consequently, followed the Bleriot system of instruction. At the time, America did not have the time, resources or pilots to establish its own program in France and therefore relied totally on the French to prepare American pilots for combat duty. American pilots with combat experience and flying time in the type of aircraft being flown at the front were a rare commodity. Many of them were flying with French units, or the Lafayette Escadrille, and chose to remain with those units rather than join the A.E.F. Gradually, American pilots, either graduates from Issodun or from the American front-line units began to replace their French counterparts. Even with this gradual transition though, the training program at Issodun remained fundamentally the Bleriot system. The various fields at Issodun (initially nine, later expanded to 15) each provided a different phase of instruction, allowing the student to progress in successive stages of training until adequately prepared to participate at the front.

Training at Issodun began at Field 1. Although the American pilots had accomplished preliminary flight training in the United States, they were for the most part an unknown commodity to their French instructors and therefore had to successfully master the "Penguin" before receiving actual flight training. The training at Field 1 was a combination of the *roleur* and *decolle* classes that the French pilots received in their preliminary training, and consisted primarily of high-speed taxi drills. The student was required to demonstrate mastery of the rudder to an instructor who observed from outside the aircraft.

The purpose behind this stage of training was two-fold. The first and primary reason was to give the American pilots a "feel" for the smaller more responsive nature of the type aircraft being used at the front. The rudders used on front-line aircraft were smaller than that of the JN-4 "Jenny," on which most Americans had received their initial training, and was therefore not as responsive on the ground. The second purpose behind this stage of training, also related to the use of the rudder on the ground, was to familiarize American pilots with characteristics of the rotary engine. The torque produced by the rotary engine, which was used in all the French pursuit aircraft, caused the airplane to "pull" to the left during ground operations. Only through proper use of the rudder could the pilot prevent what the French termed the *cheval de bois*, an extremely violent and unexpected turn on the ground.<sup>7</sup>

After having demonstrated the ability to correctly apply the rudder on the ground, the student moved on to Field 2, for training in the dual-control Nieuport 23 (so named for its 23 square meter wing surface—significantly less than that of JN-4).<sup>8</sup> The use of dual-control aircraft at Field 2 was the one major departure from the Bleriot system and came

about for two major reasons. First and foremost was the complete lack of familiarity, on the part of the American pilots, with the handling capabilities of the type of aircraft being flown at the front. Although not of the same caliber as the aircraft being flown at the front, the Nieuport 23 was a more capable and more difficult airplane to fly aircraft than the JN-4. The second factor driving the use of dual-control training the French acceptance of the efficacy of this method as the war progressed. Near the end of the war many of the French schools had also begun to use dual-control aircraft in their training programs. The course of instruction at Field 2 focused primarily on the inflight use of the rudder and of the *manettes*. Both these facets are again direct reflections of the unique nature of the rotary engine.

The throttle control of the rotary engine consisted of two levers called the *manette*. For the American pilot accustomed to the JN-4 with its stationary engine and single throttle control, the use of the French throttle system required a significant amount of study and practice. One of the levers regulated the flow of fuel to an external mixing chamber and the other controlled the mixture of fuel and air in the chamber.<sup>9</sup> This system required constant maintenance and adjustment inflight to keep the motor operating smoothly.

In addition to mastering the *manettes*, at Field 2 the student also learned the proper inflight use of the rudder with the rotary engine. American pilots trained in the JN-4 were taught to hold the nose of the aircraft down in turns to avoid loosing airspeed. The torque produced by the rotary engine tended to pull the nose of the airplane down into a spin if it was not held level during a turn. Also, many of the pilots trained on the JN-4 were

actually taught to fly with their feet off the rudder bar. Aircraft with rotary engines required constant rudder manipulation to maintain coordinated flight.

Before the student could progress to Field 3 for solo training, he had to demonstrate proficiency not only to his instructor, but also to another pilot designated as a "tester." This evaluation consisted of the student demonstrating,

...that he could take his Nieuport off in the desired direction without having it turn away from the wind, that he knew how to climb on his first turn, throttle his motor down so as to secure maximum efficiency in level flight, make his turns without losing any elevation, avoid 'skidding' (caused by too much rudder and too little bank), avoid 'slipping' (caused by too little rudder and too much bank), make 'three-point landings' with the wheels and tail skid hitting at the same moment, and, by proper use of the rudder, overcome the tendency of the Nieuport to 'cheval'...<sup>10</sup>

Once this evaluation was successfully completed, the student moved to Field 3.

The Nieuport 23 was also flown at Field 3, but was configured at this field for solo flight. The emphasis of the training at Field 3 was on the student building self-confidence in his mastery of the eccentricities of the rotary engine and the more maneuverable Nieuport 23. Take-offs, landings, left and right turns, and spirals were practiced under the watchful eye of an instructor on the ground. During this phase of training the student also began cross-country voyages to familiarize himself with the differences between French and American countrysides. At the time, aerial navigation consisted solely of finding visual references on a map. For the American pilot, who for the most part learned his early navigation skills in the wide-open spaces of the U.S., maintaining orientation over the densely populated French countryside was a daunting challenge to say the least. During the final stage of training at Field 3 the student received about an hour of acrobatic training with an instructor. The purpose of this introductory training in acrobatics was to

expose the student to the kinds of forces he would begin to experience at Field 9 and to determine whether or not he was suited to the demands of such flying.

For those who wanted to continue on as pursuit pilots, Field 9 was the critical phase of training. The single-seat Nieuport 18 (18 square meter wing surface) was flown at Field 9. It was a smaller, faster, more maneuverable and more difficult airplane to master. In 1915 and 1916 the Nieuport 18 was used extensively at the front.<sup>11</sup> The pilots who were not able to master the 18, were diverted out of the pursuit program and were sent to the bomber or reconnaissance training programs.

The training at Field 9 was broken into three phases. The first consisted of a landing class in which the student made anywhere from ten to thirty landings to familiarize himself with the faster landing speeds of the 18. This was followed by a spiral class in which the student practiced different kinds of turns including the “tight spiral” with turns using up to 90-degree bank angles. The third phase was made up of air work which introduced the student to basic combat maneuvers. All of this training was completed with the instructor observing from the ground and verbally correcting mistakes when the student landed. Those who successfully completed the work at Field 9 moved on to Fields 4,5, and 6.

The Nieuport 15 was flown at Fields 4,5, and 6. This was a smaller aircraft, with handling characteristics very similar to those being flown at the front. This stage of training emphasized the more advanced acrobatic maneuvers including the split-S, the spin and wing slips. The training during this phase also acted as a further filter to weed out those who might not be suited to pursuit aviation at the front. Those who successfully completed the training at these three fields went on to Field 7.

The Nieuport 15 was also used during this phase but was equipped with a much larger engine. Initially, the training at Field 7 was a continuation of the previous phases, with the primary emphasis being acclimation to the more powerful motor. In addition to learning the characteristics of the larger motor, the student began to learn how to fly in formation and the tactics of offensive and defensive patrols. In keeping with the French philosophy of training, the student was first introduced to the most basic formations and tactics and then gradually made familiar with the latest aerial tactics as they were being practiced at the front.<sup>12</sup> Having mastered the basics of patrol and formation flying, the pilot moved on to Field 8, the final stage of training at Issodun.

At Field 8 the student was taught some basic aerial gunnery skills. This was accomplished by having the pilot climb to a specified altitude to release a small parachute. He would then follow parachute down, trying at all times to keep his gun sights on it. After some practice with the parachute, the students engaged in mock-dogfights with the instructors. These dogfights were conducted one-on-one and in patrol formations. This was a chance for the students to all they had learned prior to going to the front. All aerial combat was conducted using camera-guns. This allowed both the instructor and student to evaluate the training and to get a feel for what might have happened in actual combat. Upon completion of the training at Field 8 most pilots attended the aerial gunnery schools at Cazaux or at St. Jean-de-Monts prior to joining the forces at the front.

When the first students of the school at Issodun reported for duty to the front the were among the most extensively trained pilots of the day. The average American pilot received about 60 hours of training at Issodun and by the time he had completed aerial gunnery school, he averaged over 100 hours of training, "...nearly triple the number of

hours of flying time with which pilots of the Royal Air Force had been reporting to their combat units two years earlier.”<sup>13</sup>

When the Armistice was signed on 11 November, 1918, Issodun was the largest flying school in the world. More than 1,800 men had attended advanced training at Issodun, of whom 829 completed the pursuit course, 627 served in combat against the Germans on the Western Front, and 202 became instructors.<sup>14</sup> The combat record of those who went to the front speaks for itself—781 enemy planes and 73 balloons destroyed at the cost of 289 aircraft and 48 balloons lost by the AEF.<sup>15</sup>

#### Notes

<sup>1</sup> Sweetser, 61.

<sup>2</sup> Elliott, 69-70.

<sup>3</sup> Cooke, 20.

<sup>4</sup> Sweetser, 62.

<sup>5</sup> Ibid.

<sup>6</sup> Cooke, 20.

<sup>7</sup> Bingham, 130

<sup>8</sup> Gates, 54.

<sup>9</sup> Bingham, 134.

<sup>10</sup> Ibid., 138.

<sup>11</sup> Ibid., 141.

<sup>12</sup> Ibid., 151.

<sup>13</sup> Gates, 129.

<sup>14</sup> David R. Mets, *Master of Airpower* (Novato, CA: Presidio Press, 1988), 31.

<sup>15</sup> Ibid.

## **Chapter 7**

### **Conclusion**

In the 80 years following World War I America's pilot training program has remained, at a very fundamental level, unchanged. Intensive ground training followed by incremental flying training using both dual-control and solo flight methods remain the core of today's training programs much as they were in 1917. Although it is tempting to declare the Army Air Service's pilot training program in World War another triumph for American ingenuity and know-how, nothing could be further from the truth. While the story of the making of America's first eagles is truly phenomenal, it is anything but uniquely American.

In April, 1917, America faced the task of fighting a war that she was by no means prepared to fight. Not only was America faced with the daunting challenges of mobilizing an army ill-prepared to fight a major conflict but, she also had to create an air force from virtual non-existence. There was no industrial base from which to build the aircraft for an air force and no training program to develop the aviators to fly the aircraft once they were built. Lt Col Hiram Bingham, one of the early developers of the American aviation training program summarized the state of affairs in April, 1917:

We lacked men of experience; we lacked able executive officers with a sympathetic knowledge of aviation; we lacked airplanes fit to fly against the Huns; and we lacked the facilities for building them....In other words,

America expected to win the war in the air and was utterly unprepared to do so.<sup>1</sup>

While the Allies fully expected American industrial might to contribute significantly to aircraft production, the more immediate problem was the supply of trained aviators.

With virtually no training program in existence and relatively little time to develop one, the decision was made early on to implement training programs which mirrored the tested and well-proven programs of the Allies. Canada, as our closest ally, provided the solution for our stateside training program. The Canadian system was based on the RFC training program and was adopted by the U.S. in total. This system used dual-control training intermingled with solo flights and provided the most rapid means of accomplishing preliminary and advanced training prior to sending American pilots to France for combat duties.

Training at the preliminary schools in U.S. began almost immediately but it soon became apparent that the advanced schools would not be able to produce pilots front-line duty quickly enough. In an effort to speed up the process of producing combat-ready pilots, the decision was made to open an American school (Issodun) in France. Establishing the school at Issodun not only sped-up the process of producing pilots, it also improved the quality of training for those pilots. Instead of waiting for advanced training in the U.S., American pilots would receive training from combat veterans, in aircraft similar to those being flown at the front.

Within months of the decision to establish an American school at Issodun, often referred to as the largest mudhole in France, the 3<sup>rd</sup> AIC was fully functional and training American pilots. Issodun was made up of many individual airfields (as many as 15 by the

end of the war) with different phases of instruction occurring at each field. Initially the preponderance of instructors and aircraft were French and naturally the training method used was the French Bleriot system. This system was based on teaching self-reliance and followed a very structured program. With the exception of the training at Field 2, all flight training was accomplished by the students without an instructor. Even though the American pilots had already received preliminary training in the U.S., this type of training added greatly to the self-confidence of the individual pilots and produced the likes of Eddie Rickenbacker and Frank Luke, Jr.

While the American training system was still not producing aviators in the numbers promised upon her entry into World War I, by November 11, 1918 the American training program was producing combat-ready aviators in significant numbers. By all estimates, if the war had continued, America would have probably exceeded all expectations in producing aircraft, aircraft mortars and most importantly, pilots. At the signing of the Armistice, the Army Air Service had grown from an air force of only 65 rated officers to one with 80 aces (5 or more “kills”) in a time span of only 17 months.<sup>2</sup> The combat success of America’s fledgling eagles is a direct result of the of the training programs adopted in the United States and at the pursuit school at Issodun.

#### Notes

<sup>1</sup> Bingham, xii.

<sup>2</sup> Arch Whitehouse, *The Years of the Sky Kings* (Garden City, NY: Doubleday & Company, Inc., 1959), 309-310.

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